

## Contributors to This Issue

A. C. BECK, E.E., Rensselaer Polytechnic Institute, 1927; Instructor, Rensselaer Polytechnic Institute, 1927-1928; Bell Telephone Laboratories, 1928 -. With the Radio Research Department he was engaged in the development and design of short-wave and microwave antennas. During World War II he was chiefly concerned with radar antennas and associated waveguide structures and components. For several years after the war he worked on development of microwave radio repeater systems. Later he worked on microwave transmission developments for broadband communication. Recently he has concentrated on further developments in the field of broadband communication using circular waveguides and associated test equipment.

J. S. COOK, B.E.E., and M.S., Ohio State University, 1952; Bell Telephone Laboratories, 1952 -. Mr. Cook is a member of the Research in High-Frequency and Electronics Department at Murray Hill and has been engaged principally in research on the traveling-wave tube. Mr. Cook is a member of the Institute of Radio Engineers and belongs to the Professional Group on Electron Devices.

O. E. DELANGE, B.S. University of Utah, 1930; M.A. Columbia University, 1937; Bell Telephone Laboratories, 1930 -. His early work was principally on the development of high-frequency transmitters and receivers. Later he worked on frequency modulation and during World War II was concerned with the development of radar. Since that time he has been involved in research using broadband systems including microwave and baseband. Mr. DeLange is a member of the Institute of Radio Engineers.

R. KOMPFFNER, Engineering Degree, Technische Hochschule, Vienna, 1933; Ph.D., Oxford, 1951; Bell Telephone Laboratories, 1951 -. Between 1941-1950 he did work for the British Admiralty at Birmingham University and Oxford University in the Royal Naval Scientific Service. He invented the traveling-wave tube and for this achievement Dr. Kompfner received the 1955 Duddell Medal, bestowed by the Physical Society of England. In the Laboratories' Research in High Frequency

and Electronics Department, he has continued his research on vacuum tubes, particularly those used in the microwave region. He is a Fellow of the Institute of Radio Engineers and of the Physical Society in London.

CHARLES A. LEE, B.E.E., Rensselaer Polytechnic Institute, 1943; Ph.D., Columbia University, 1953; Bell Telephone Laboratories, 1953-. When Mr. Lee joined the Laboratories he became engaged in research concerning solid state devices. In particular he has been developing techniques to extend the frequency of operation of transistors into the microwave range, including work on the diffused base transistor. During World War II, as a member of the United States Signal Corps, he was concerned with the determination and detection of enemy countermeasures in connection with the use of proximity fuses by the Allies. He is a member of the American Physical Society and the American Institute of Physics. He is also a member of Sigma Xi, Tau Beta Pi and Eta Kappa Nu.

JOHN R. PIERCE, B.S., M.S. and Ph.D., California Institute of Technology 1933, 1934 and 1936; Bell Telephone Laboratories, 1936-. Appointed Director of Research — Electrical Communications in August, 1955. Dr. Pierce has specialized in Development of Electron Tubes and Microwave Research since joining the Laboratories. During World War II he concentrated on the development of electronic devices for the Armed Forces. Since the war he has done research leading to the development of the beam traveling-wave tube for which he was awarded the 1947 Morris Liebmann Memorial Prize of the Institute of Radio Engineers. Dr. Pierce is author of two books: *Theory and Design of Electron Beams*, published in second edition last year, and *Traveling Wave Tubes* (1950). He was voted the "Outstanding Young Electrical Engineer of 1942" by Eta Kappa Nu. Fellow of the American Physical Society and the I.R.E. Member of the National Academy of Sciences, the A.I.E.E., Tau Beta Pi, Sigma Xi, Eta Kappa Nu, the British Interplanetary Society, and the Newcomen Society of North America.

C. F. QUATE, B.S., University of Utah 1944; Ph.D., Stanford University 1950; Bell Laboratories 1950-. Dr. Quate has been engaged in research on electron dynamics — the study of vacuum tubes in the microwave frequency range. He is a member of I.R.E.

DAVID SLEPIAN, University of Michigan, 1941-1943; M.A. and Ph.D., Harvard University, 1946-1949; Bell Telephone Laboratories, 1950-. Dr.

Slepian has been engaged in mathematical research in communication theory, switching theory and theory of noise. Parker Fellow in physics, Harvard University 1949-50. Member of I.R.E., American Mathematical Society, the American Association for the Advancement of Science and Sigma Xi.

MILTON SOBEL, B.S., City College of New York, 1940; M.A., 1946 and Ph.D., 1951, Columbia University; U. S. Census Bureau, Statistician, 1940-41; U. S. Army War College, Statistician, 1942-44; Columbia University, Department of Mathematics, Assistant, 1946-48 and Research Associate 1948-50; Wayne University, Assistant Professor of Mathematics, 1950-52; Columbia University, Department of Mathematical Statistics, Visiting Lecturer, 1952; Cornell University, fundamental research in mathematical statistics, 1952-54; Bell Telephone Laboratories, 1954-. Dr. Sobel is engaged in fundamental research on life testing reliability problems with special application to transistors and is a consultant on many Laboratories projects. Member of Institute of Mathematical Statistics, American Statistical Association and Sigma Xi.

MORRIS TANENBAUM, A.B., Johns Hopkins University, 1949; M.A., Princeton University, 1950; Ph.D. Princeton University, 1952; Bell Telephone Laboratories, 1952-. Dr. Tanenbaum has been concerned with the chemistry and semiconducting properties of intermetallic compounds. At present he is exploring the semiconducting properties of silicon and the feasibility of silicon semiconductor devices. Dr. Tanenbaum is a member of the American Chemical Society and American Physical Society. He is also a member of Phi Lambda Upsilon, Phi Beta Kappa and Sigma Xi.

DONALD E. THOMAS, B.S. in E.E., Pennsylvania State College, 1929; M.A., Columbia University, 1932; Bell Telephone Laboratories, 1929-1942, 1946-. His first assignment at the Laboratories was in submarine cable development. Just prior to World War II he became engaged in the development of sea and airborne radar and continued in this work until he left for military duty in 1942. During World War II he was made a member of the Joint and Combined Chiefs of Staff Committees on Radio Countermeasures. Later he was a civilian member of the Department of Defense's Research and Development Board Panel on Electronic Countermeasures. Upon rejoining the Laboratories in 1946, Mr. Thomas was active in the development and installation of the first deep sea repeated submarine telephone cable, between Key West and Havana,

which went into service in 1950. Later he was engaged in the development of transistor devices and circuits for special applications. At the present time he is working on the evaluation and feasibility studies of new types of semiconductor devices. He is a senior member of the I.R.E. and a member of Tau Beta Pi and Phi Kappa Phi.

LAURENCE R. WALKER, B.Sc. and Ph.D., McGill University, 1935 and 1939; University of California 1939-41; Radiation Laboratory, Massachusetts Institute of Technology, 1941-45; Bell Telephone Laboratories, 1945-. Dr. Walker has been primarily engaged in the development of microwave oscillators and amplifiers. At present he is a member of a physical research group concerned with the applied physics of solids. Fellow of the American Physical Society.

